

Date: Wednesday, 19/11/2008 10:09:31 AM  
 User: Julie Dawson

## Process Sheet

<b>Customer</b> : CU-DAR001 Dart Helicopters Services	<b>Drawing Name</b> : BUBBLE WINDOW, RH
<b>Job Number</b> : 43547	
<b>Estimate Number</b> : 11394	
<b>P.O. Number</b> :	<b>Part Number</b> : D32692
<b>This Issue</b> : 19/11/2008 <b>S.O. No.</b> :	<b>Drawing Number</b> : D3269
<b>Prsht Rev.</b> : NC	<b>Project Number</b> : N/A
<b>First Issue</b> : / / <b>Type</b> : THERMOFORMING	<b>Drawing Revision</b> : D/B
<b>Previous Run</b> : 43546	<b>Material</b> :
<b>Written By</b> :	<b>Due Date</b> : 26/11/2008 <b>Qty:</b> 2 <b>Um:</b> Each
<b>Checked &amp; Approved By</b> : <u>JUD 08.11.19</u>	
<b>Comment</b> :	
Est. A 05.03.22 New issue KJ/JLM	
Est B 05.05.09 Added engraving EC	
Est Rev:06-07-03 As per Rev C JLM	
Est C 07.11.06 Thermoform in-house DL verified by:EC	
Est. Rev: D 08.07.24 As per New Tool DL.	

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	HAND FINISH TH	HAND FINISHING THERMOFORMING
-----	----------------	------------------------------



Comment: HAND FINISHING THERMOFORMING

Set up Clamping Frame and Load Program  
 as per Folio FTA 014

BB 08/11/27 (X2)

2.0	MACRYLICS177	0.177" PLEXIGLAS G CLEAR CAST ACRYLIC SH
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Comment: Qty.: 10.0000 sf(s)/Unit Total: 20.0000 sf(s)  
 0.177" PLEXIGLAS G CLEAR CAST ACRYLIC SH

1) Batch # M 108784

BB 08/11/27 (X2)

3.0	HAND FINISH TH	HAND FINISHING THERMOFORMING
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Comment: HAND FINISHING THERMOFORMING

1) Cut Blanks to 30" by 48"

BB 08/11/27 (X2)

4.0	THERMOFORMING	THERMOFORMING MACHINE
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Comment: THERMOFORMING MACHINE

Thermoform as per Dwg. D3269 and Folio FTA 014

Dwg. Rev. PC  
 Folio Rev. C

BB 08/11/27 (X2)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Wednesday, 19/11/2008 10:09:31 AM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BUBBLE WINDOW, RH

Job Number: 43547

Part Number: D32692

Job Number:



Seq. #:	Machine Or Operation:	Description :
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5.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

- 1) Check Surface finish for undesired marks, voids, dimples etc.
- 2) Check depth of bubble to ensure conformity to drawing tolerances.

6.0

QC8

SECOND CHECK



Comment: SECOND CHECK

7.0

HAND FINISH TH

HAND FINISHING THERMOFORMING



Comment: HAND FINISHING THERMOFORMING

- 1) Trim off excess flange material
- 2) Buff out any light scratches or blemishes
- 3) Etch part number and batch number

8.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

- 1) Visually inspect for clarity, and proper formation.

9.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

10.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



MF 08-11-27

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**DART**

DESIGN <i>GP</i>	DRAWN BY <i>LE</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>GP</i>	APPROVED <i>[Signature]</i>	DRAWING NO. DSI 9329	REV. B SHEET 1 OF 1
DATE 06.06.26		TITLE BUBBLE WINDOW INSTALL MOD.	SCALE NTS
A	06.04.25	NEW ISSUE	
B	06.06.26	CHG TO EFFECTIVE AFTER CHG 002	

**DART SERVICE INSTRUCTION**  
TO AMEND INSTALLATION INSTRUCTIONS IIN-D044-713 REV. A  
REF. CANADIAN STC: SH05-13 ISSUE 1  
REF. FAA STC: SR02088NY

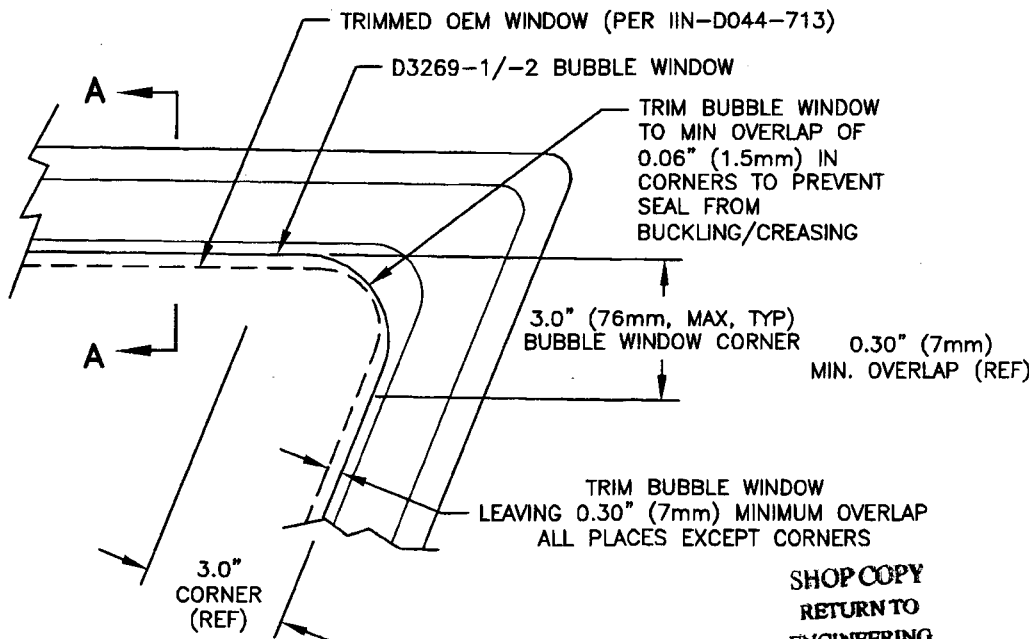
**PURPOSE:** For the D044-713-013/-014 kits supplied after CHG 002, the D3267-1/-2 bubble windows have been supplied untrimmed to allow for easier installation in the field. The installer must trim the windows in accordance with these instructions prior to installation.

**PROCEDURE:**

- 1) Modify the R44 crew door per items 3.2.1 and 3.2.2 of Installation Instructions IIN-D044-713 Rev.A.
- 2) Fit and trim the D3269-1/-2 Bubble Window to match the cutout in the door as follows: The bubble window must be a minimum of 0.30" (7mm) larger than the cutout in the OEM window as shown in the figure below. However, in the corners of the window, it is acceptable to trim a 0.06" minimum overlap (1.5mm) to help prevent the D2126-0903 Seal from buckling/creasing in the corners. The edge of the bubble window must be deburred to a smooth finish.
- 3) Continue installing the bubble window per items 3.2.3 through 3.2.5 of the installation instructions.

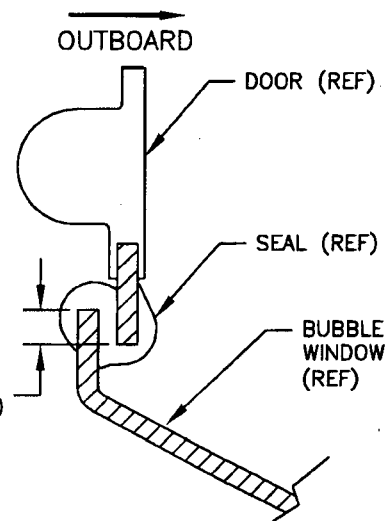
**FIGURE 1**

LOOKING AT INSIDE CORNER OF DOOR



**SECTION A-A**

(NOT TO SCALE)



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WORK ORDER  
NO. 75541

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

APPROVED

BY: [Signature]  
D. SHEPHERD (DE # 02)

DATE: 06.06.26  
CERT. NO.: SH05-13  
ISSUE NO.: 1

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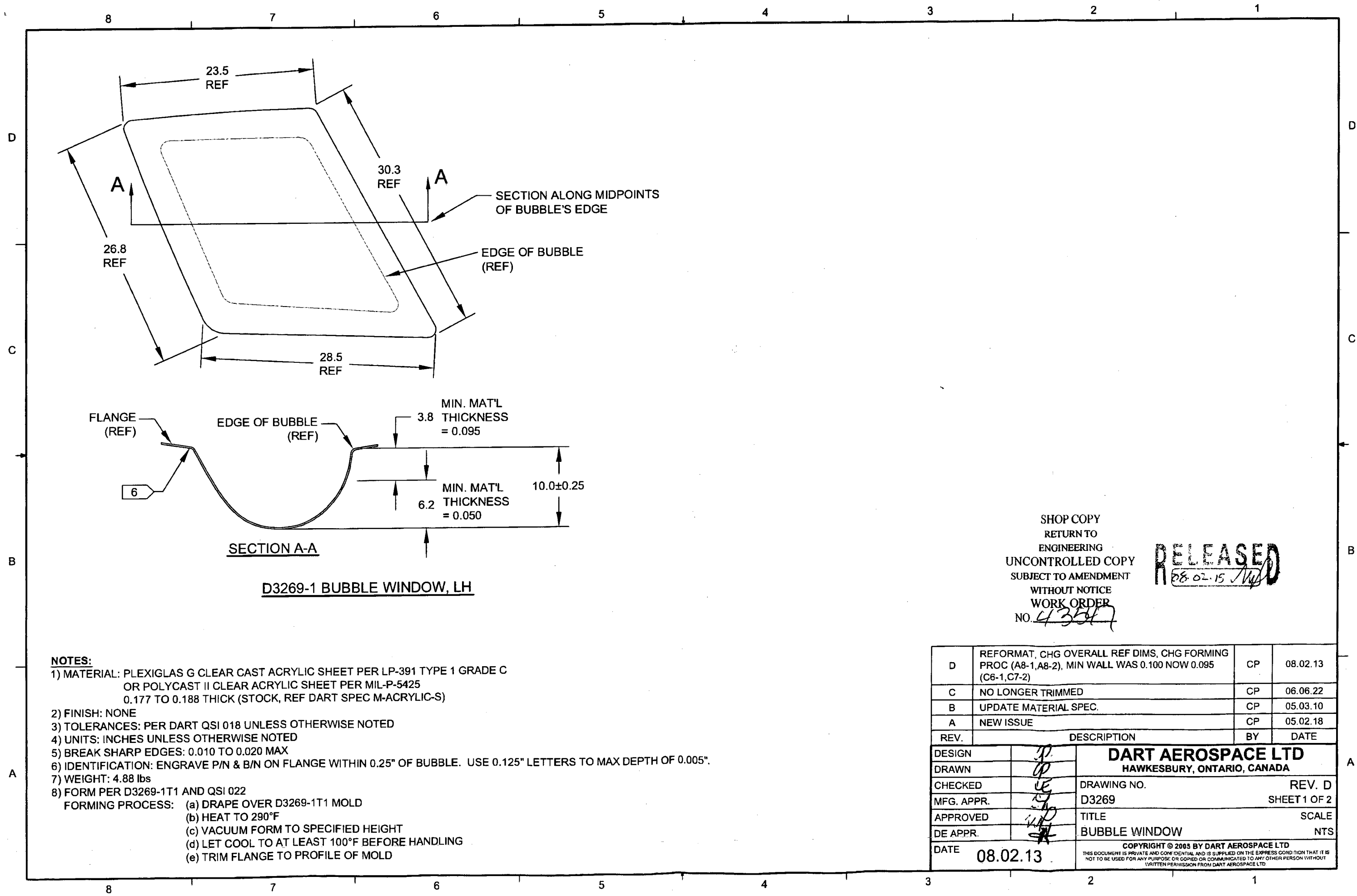
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



D3269-1 BUBBLE WINDOW, LH

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WORK ORDER  
NO. 43547

RELEASED  
08.02.13

- NOTES:
- 1) MATERIAL: PLEXIGLAS G CLEAR CAST ACRYLIC SHEET PER LP-391 TYPE 1 GRADE C OR POLYCAST II CLEAR ACRYLIC SHEET PER MIL-P-5425 0.177 TO 0.188 THICK (STOCK, REF DART SPEC M-ACRYLIC-S)
  - 2) FINISH: NONE
  - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
  - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
  - 5) BREAK SHARP EDGES: 0.010 TO 0.020 MAX
  - 6) IDENTIFICATION: ENGRAVE P/N & B/N ON FLANGE WITHIN 0.25" OF BUBBLE. USE 0.125" LETTERS TO MAX DEPTH OF 0.005".
  - 7) WEIGHT: 4.88 lbs
  - 8) FORM PER D3269-1T1 AND QSI 022
- FORMING PROCESS:
- (a) DRAPE OVER D3269-1T1 MOLD
  - (b) HEAT TO 290°F
  - (c) VACUUM FORM TO SPECIFIED HEIGHT
  - (d) LET COOL TO AT LEAST 100°F BEFORE HANDLING
  - (e) TRIM FLANGE TO PROFILE OF MOLD

D	REFORMAT, CHG OVERALL REF DIMS, CHG FORMING PROC (A8-1,A8-2), MIN WALL WAS 0.100 NOW 0.095 (C6-1,C7-2)	CP	08.02.13
C	NO LONGER TRIMMED	CP	06.06.22
B	UPDATE MATERIAL SPEC.	CP	05.03.10
A	NEW ISSUE	CP	05.02.18
REV.	DESCRIPTION	BY	DATE
DESIGN	P	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	P		
CHECKED	U		
MFG. APPR.	U		
APPROVED	U		
DE APPR.	U	DRAWING NO.	REV. D
		D3269	SHEET 1 OF 2
		TITLE	SCALE
		BUBBLE WINDOW	NTS
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8

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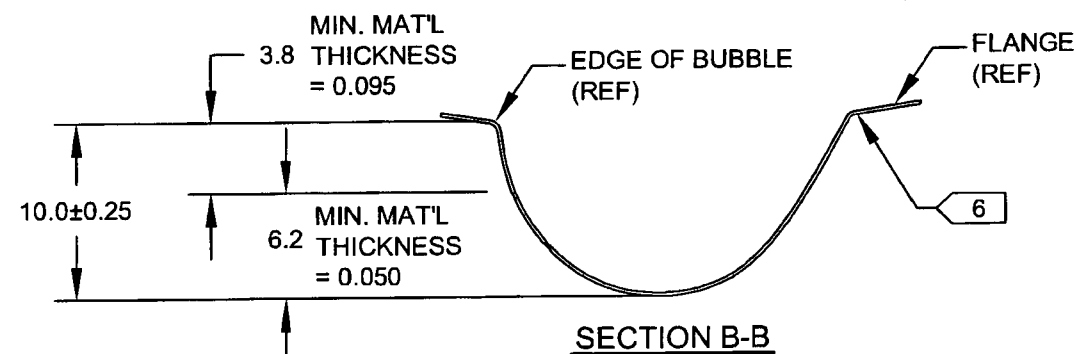
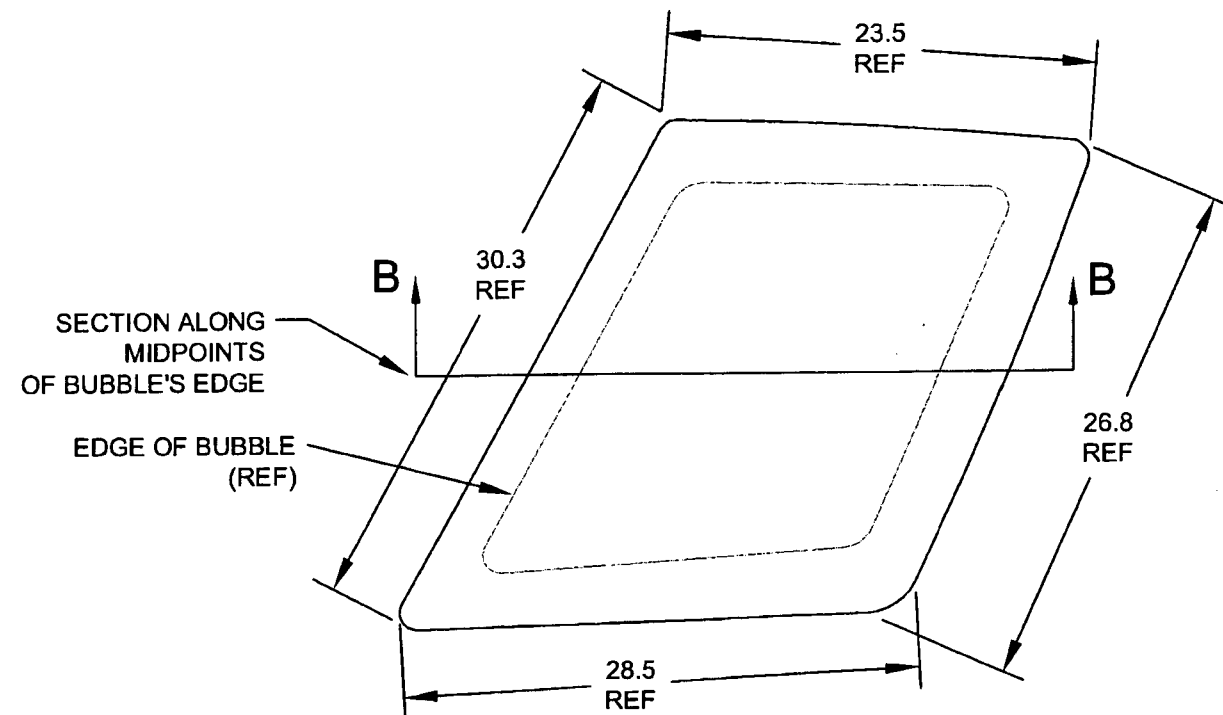
1

D

C

B

A



D3269-2 BUBBLE WINDOW, RH

#### NOTES

- 1) MATERIAL: PLEXIGLAS G CLEAR CAST ACRYLIC SHEET PER LP-391 TYPE 1 GRADE C OR POLYCAST II CLEAR ACRYLIC SHEET PER MIL-P-5425  
0.177 TO 0.188 THICK (STOCK, REF DART SPEC M-ACRYLIC-S)
  - 2) FINISH: NONE
  - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
  - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
  - 5) BREAK SHARP EDGES: 0.010 TO 0.020 MAX
  - 6) IDENTIFICATION: ENGRAVE P/N & B/N ON FLANGE WITHIN 0.25" OF BUBBLE. USE 0.125" LETTERS TO MAX DEPTH OF 0.005".
  - 7) WEIGHT: 4.88 lbs
  - 8) FORM PER D3269-2T1 AND QSI 022
- FORMING PROCESS:
- (a) DRAPE OVER D3269-2T1 MOLD
  - (b) HEAT TO 290°F
  - (c) VACUUM FORM TO SPECIFIED HEIGHT
  - (d) LET COOL TO AT LEAST 100°F BEFORE HANDLING
  - (e) TRIM FLANGE TO PROFILE OF MOLD

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DRAWN		<b>HAWKESBURY, ONTARIO, CANADA</b>	
CHECKED		DRAWING NO.	REV. D
MFG. APPR.		D3269	SHEET 2 OF 2
APPROVED		TITLE	SCALE
DE APPR.		BUBBLE WINDOW	NTS
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DART AEROSPACE LTD		WORK ORDER:	43547
Description: R 44 Bubble Window RH		Part Number:	D3269-2
Inspection Dwg: D3269	Rev: D	Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article    ☐ Prototype

(Step 4) Thermoforming  
Visual Inspection Sign-off

Description	Initials
	<i>[Signature]</i>
Depth of bubble within tolerances	<i>[Signature]</i>
Acceptable shape definition	<i>[Signature]</i>
Free of visual flaws (bumps, cracks, voids, etc.)	<i>[Signature]</i>

(Step 6) Trimming  
FAI Checklist

Inspect dimensions highlighted on inspection sheet drawing D3269 Rev. D and record below

Drawing	Tolerance	Actual	Accept	Reject	Method of Inspection	Comments
Dimension		Dimension				
depth of bubble 10"	+/- 0.25"	10.4	✓			
23.5	+/- 0.100	23.5"	✓			
26.8	+/- 0.100	26.7"	✓			
28.5	+/- 0.100	28.4"	✓			
30.3	+/- 0.100	30.25"	✓			
top 6.2" of bubble	0.050" Min	0.059"	✓			
Lower 3.8" of bubble	0.095" Min	0.107"	✓			

Measured by:	<i>[Signature]</i>
Date:	08/11/26

Audited by:	<i>[Signature]</i>
Date:	08/11/26

Prototype Approval:	<i>[Signature]</i>
Date:	11/19

Rev	Date	Change	Revised by	Approved
		New Issue		

#2

DART AEROSPACE LTD		WORK ORDER: 43547
Description: R 44 Bubble Window RH		Part Number: D3269-2
Inspection Dwg: D3269	Rev: D	Page 1 of 1

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article    ☐ Prototype

(Step 4) Thermoforming  
Visual Inspection Sign-off

Description	Initials
Depth of bubble within tolerances	WJ
Acceptable shape definition	WJ
Free of visual flaws (bumps, cracks, voids, etc.)	WJ

### (Step 6) Trimming FAI Checklist

Inspect dimensions highlighted on inspection sheet drawing D3269 Rev. D and record below

Drawing	Tolerance	Actual	Accept	Reject	Method of	Comments
Dimension		Dimension			Inspection	
depth of bubble 10"	+/- 0.25"	10"	✓			
23.5	<del>REF +/- 0.100</del>	23.5"	✓			
26.8	<del>REF +/- 0.100</del>	26.5"	✓			
28.5	<del>REF +/- 0.100</del>	28.4"	✓			
30.3	<del>REF +/- 0.100</del>	30.3"	✓			
top 6.2" of bubble	0.050" Min	0.054"	✓			
Lower 3.8" of bubble	0.095" Min	0.097"	✓			

Measured by: <u>WJ</u>	Audited by: <u>[Signature]</u>	Prototype Approval: <u>[Signature]</u>
Date: <u>08.11.26</u>	Date: <u>06/11/26</u>	Date: <u>1/11</u>

Rev	Date	Change	Revised by	Approved
		New Issue		